

ABSTRACT OF THE INVENTION

A method for forming an emitter tip for use in a field emission device. An emitter layer is provided over a substrate. The emitter layer is overlaid with a blanket dielectric which is in turn overlaid by a masking layer. In a first etching operation, a masking island and an underlying dielectric island are formed from the masking layer and the blanket dielectric, respectively. These islands serve as a masking structure during subsequent etching processes by which an emitter tip is formed from the emitter layer. Accordingly, a second etching operation is conducted, whereby an etch chemistry which exhibits both isotropic and anisotropic characteristics is used to remove a portion of the emitter layer by undercutting beneath the masking structure. A third etching operation is conducted, wherein the etch chemistry is substantially more anisotropic than the etch chemistry of the second etching operation. The second and third etches mobilize a portion of the masking layer and form an emitter tip from the emitter layer. The emitter tip has a substantially rectilinear vertical profile.

G:\DATA\PAT\11675163 2PA